Electrical Parts

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Sec 1 Troubleshooting

1-1 Winding unit alarms

Alarm recovery method

- **Package alarms**

Alarm LED	Upper level light on
Status display	P*

* After checking the conditions of the end of the yarn on a package, press the illuminated reset switch (upper level).

- **Bobbin alarms**

Alarm LED	Lower level light on
Status display	b*

* After checking the conditions of the bobbins, press the illuminated reset switch (lower level).

- **Other alarms**

Alarm LED	Mid-level light on
Status display	Other than the above

* If the alarm continues to sound, clear it by following the clearing procedure from the VOS screen.

Alarm type & description

Status display	Alarm type	Cause
01	Compiling error	Program fault
02	Calculation error	Program fault
03	Calculation error (latch)	Program fault
04	Sequence arithmetic stop error	Program fault
05	Carrying error	Program fault
08	Backup error	Data initialization
09	Program compatibility error	System program and sequence program compatibility error
11	DISPLAY PCB alarm	DISPLAY PCB error
12	SPLICER PCB alarm	SPLICER PCB error
13	MIDDLE PCB alarm	MIDDLE PCB error
14	BALCON PCB alarm	BALCON PCB error
15	M/G CAN PCB alarm	M/G CAN PCB error
60	DRUM BLD: Communication timeout between SPC	Communication error with UNIT-SPC
61	DRUM BLD: CPU error	CPU error
62	DRUM BLD: Low voltage (Momentary outage)	Low voltage
63	DRUM BLD: High voltage	High voltage
64	DRUM BLD: Drum sensor error	Drum sensor input error

Status display	Alarm type	Cause
65	DRUM BLD: CS sensor error	CS sensor input error
66	DRUM BLD: Speed deviation	Speed deviation
67	DRUM BLD: Motor overheat protection (thermistor)	Motor temperature high
68	DRUM BLD: Overload (thermal)	Overload occurred
69	DRUM BLD: High voltage	Overcurrent generated
6A	DRUM BLD: IPM fault	IPM fault
6b	DRUM BLD: CS sensor input error	CS sensor input error
6C	DRUM BLD: CS Sensor reverse rotation error	Drum rotated in reverse
6d	DRUM BLD: IPM temperature error	High IPM temperature, abnormal value
6E	DRUM-BLD: Ground fault	Ground fault protection
6F	DRUM BLD:Ready OFF	Ready signal OFF
90	Air heater overheat alarm	Overheating error on air heater
91	Air heater disconnect alarm	Air heater is disconnected
92	Air heater temperature fluctuation alarm	Air temperature is fluctuating excessively from the set temperature
93	Temperature sensor disconnect alarm	Sensor that monitors the heater temperature is damaged or disconnected
94	Temperature control PCB communication alarm	Communication error between UNIT SPC and HOT SPLICER controller
95	CPU error on temperature control PCB	CPU error occurred on temperature control PCB
A1	Yarn threading error (system)	Yarn threading error Yarn break occurred right after drum start
A2	Yarn threading error (AD)	AD error
A3	Take-up tube supply error	Take-up tube not ready
A4	Rear package not processed	Doffing operation not possible due to package at rear
A5	AD unit No. recognition error	Infrared communication failure between the unit and AD
b0	Bobbin supply error	No bobbin supplied
b1	Lower yarn pickup error	Lower yarn pickup error
b2	---	---
b3	Start up cut alarm	Clearer cut occurs frequently
b4	---	---
b5	Yarn count alarm (UQC) Yarn Count alarm (iQON) Yarn count alarm (YM) Yarn count alarm (KC)	---
b6	Pearl chain alarm (UQC) Pearl Chain alarm (iQON) CLUSTER alarm (YM) IPM alarm (KC)	---
b7	Moire alarm (UQC) Moire alarm (iQON)	---
b8	CV alarm (UQC) CV alarm (iQON) CV alarm (KC)	---
b9	Foreign fiber alarm (UQC) Foreign fiber alarm (iQON) Foreign fiber alarm (YM) DM alarm (KC)	---

Status display	Alarm type	Cause
bA	Hairiness alarm (UQC) Hairiness alarm (iQON) SFI alarm (YM)	---
bb	IPI alarm (UQC) IPI alarm (iQON)	---
bC	CMT alarm (UQC) CMT alarm (iQON)	---
bd	YF alarm (UQC) YF alarm (iQON)	---
bE	MF alarm (UQC) MF alarm (iQON) FF CLUSTERalarm (YM)	---
bF	Other alarms	---
bG	PP alarm (UQC) PP alarm (iQON) Palarm (YM)	---
C0	Clearer zero adjustment alarm	Clearer zero adjusting error
C1	Clearer slot jammed alarm	Yarn waste clog in clearer slot
C2	Insufficient cut alarm	Clearer did not cut sufficiently
C3	Clearer technical alarm	Clearer technical alarm occurred * Refer to clearer alarm screen.
C4	Clearer initial state alarm	The clearer did not finish initializing
d1	Drum lapping alarm	Drum lapping occurred
d2	Traverse Error	Traverse error detected
d3	Traverse error (2 W <-> 2.5 W)	Traverse solenoid
E1	Splicer home position sensor alarm	Splicer operation error Splicer home position sensor alarm
E2	Splicer yarn guide lever home position sensor alarm	Splicer yarn guide lever operation error Splicer yarn guide lever home position sensor error
E3	Bal-Con sensor alarm Bobbin sensor alarm Package diameter detection sensor alarm	Bobbin (package) detection sensor error
E4	---	---
E5	PC sensor alarm	Insufficient drum rotation during reverse operation
E6	Package rotating sensor alarm	Package rotating sensor error
E7	Retie pipe home position sensor alarm	Retie pipe operation error Retie pipe home position sensor error
E8	PLC21 alarm	PLC21 yarn travel detection error * Dirty receiver and transmitter windows, etc.
E9	Lower yarn sensor alarm	Lower yarn sensor error * Dirty receiver and transmitter windows, etc.
EA	PC sensor alarm	PC sensor error Tension error detected
Eb	Upper yarn sensor alarm	Upper yarn sensor malfunction
EC	Drum lapping detection sensor alarm	Drum lapping or winding detection sensor error
Ed	Traverse sensor alarm	Traverse sensor error
EE	Waste yarn detection sensor alarm	Waste yarn detection sensor error
EF	Tensor operation check sensor alarm	Tensor opener operation error Tensor operation check sensor error
EG	Suction mouth angle sensor alarm	Shutter mouth operation error Suction mouth angle sensor error

Status display	Alarm type	Cause
EH	Shutter home position sensor alarm	Shutter operation error Shutter home position sensor error
EJ	Bal-Con home position sensor alarm	Bal-Con operation error Bal-Con home position sensor error
EL	Peg home position sensor alarm Tray eject home position sensor alarm	Peg operation error Peg home position sensor error Tray eject operation error Tray eject home position sensor error
En	Magazine can position sensor alarm	Magazine can operation error Magazine can home position sensor error
Eo	Yarn guide lever home position sensor alarm	Yarn guide lever operation error Yarn guide lever home position sensor error
EP	Yarn pickup lever home position sensor alarm	Yarn pickup lever operation error Yarn pickup lever home position sensor error
Er	Upper yarn sensor detection error alarm	Upper yarn sensor detection error occurred
H1	Suction shutter cotton fly clog	Cotton fly is clogged in suction shutter
n1	Bal-Con down alarm	Bobbin detection sensor is left ON after drum start
n2	Bal-Con Up alarm	Bal-Con up error
o1	Unconsumed wax alarm	Wax application failure
o2	No wax alarm	No wax
P0	No package alarm	No package equipped on cradle
P1	Upper Yarn End Find Error	---
P2	Upper double yarn alarm	Double yarn detected during upper yarn end find operation
P3	Sizing alarm	Package diameter exceeds the specified value
P4	Package Brake Error	Package does not stop within specified time
P5	PJC alarm (upper limit)	Too many yarn breaks/packages
P6	PJC alarm (lower limit)	Too few yarn breaks/packages
P7	Package half-locked alarm	Bad package rotation occurred
P8	Vibration alarm	High vibration during winding
r0	R/W module communication alarm	Communication error between UNIT SPC and R/W module
r1	Tag communication alarm	R/W module can’t communicate with tag on tray
S1	Mis-splicing	---
S2	Splicer Cut	---
S3	Air Heater Temperature	Change Air heater is out of range for set temperature
T1	Tension break alarm	Frequent breaks in tension
T3	Tension error (LOW)	Tension error (LOW) detected * Tensor is off, etc
T4	Tension error (HIGH)	Tension error (HIGH) detected
T5	Winding tension is error (H)	The tension during winding is higher than other units
T6	Winding tension is error (L)	The tension during winding is lower than other units
T7	Tensor level error (H)	The applied tension level during winding is higher than other units
T8	Tensor level error (L)	The applied tension level during winding is lower than other units
u1	DC5V Power Supply Error	Line voltage error detected on DC5V power supply
u2	DC15V Power Supply Error	Line voltage error detected on DC15V power supply
u3	DC24V Power Supply Error	Line voltage error detected on DC24V power supply

1-2 Main machine alarm

Main machine Fixer call

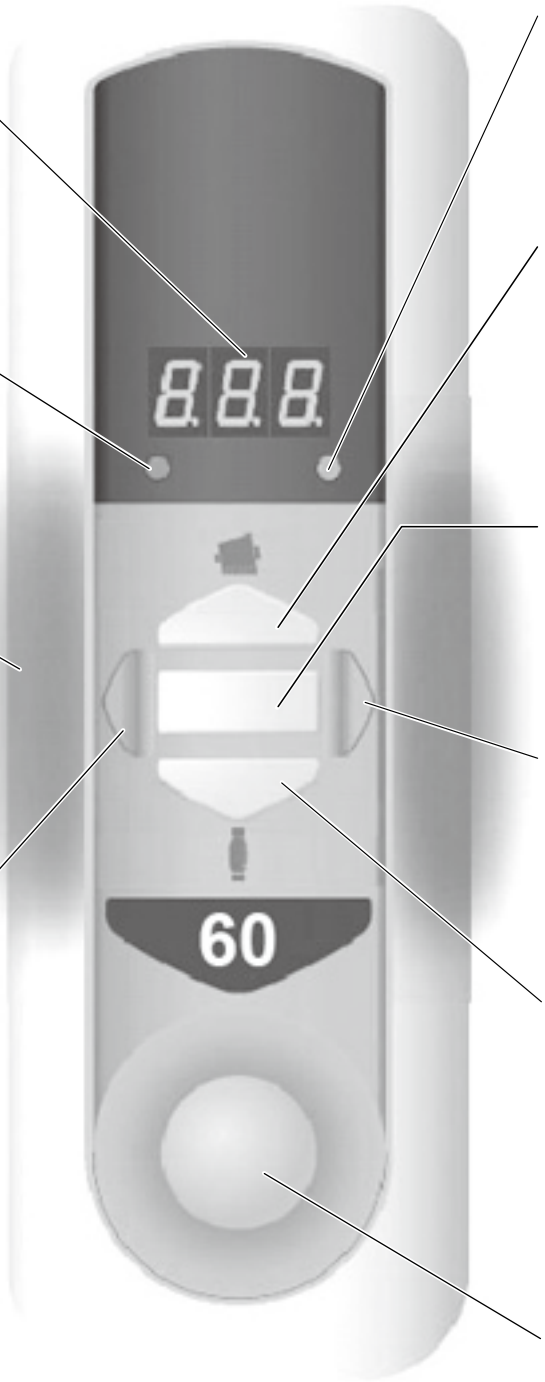
Classification	Alarm type	Signal tower		Rotation signal warning		Machine Status	Cause
		Red	Yellow	Red	Yellow		
Machine	Emergency Stop	Flashing		Lit		Machine operation stopped	Emergency stop switch pressed
	Emergency stop switch (Wire switch)						Wire switch is pulled
	Communication Error	Flashing (High speed)				Machine operation continued	Communication error occurred between devices inside machine
	Momentary Outage, or Blower Outage	Flashing				Machine operation stopped	Momentary outage or power outage occurred
	Air down						Main air pressure low
	Lower static pressure/static pressure error						• Yarn wasted accumulation inside blower box • Static pressure gauge disconnection • Air pipe missing
	Static pressure fluctuation error					Continued machine operation (Alarm displayed only on VOS)	Yarn wasted accumulation inside blower box
Main control box	DC24V input power alarm	Flashing				Machine operation stopped	Input fuse break (Main fiber SPC, expanded PCB or interface PCB)
	DC24V output power alarm						Output fuse break (Main fiber SPC, expanded PCB or interface PCB)
	Stop button contact error						Stop button contact error
	Blower inverter alarm						Blower inverter alarm occurred
	Conveyor, Blow Cleaner Trip						Motor breaker trip on conveyor or blow cleaner
	Return conveyor inverter alarm						Return conveyor inverter alarm occurred
	Return conveyor inverter communication error						• Inverter failure • Cable disconnection
	Dust Collector Thermal Trip						Motor breaker trip on dust collector
	Control panel overheat alarm					Machine operation continued	High temperature inside control box, exceeds constant temperature level
	Cooling fan alarm						Cooling fan overheating
	Power meter power supply voltage error					Continued machine operation (Alarm displayed only on VOS)	• Power supply voltage fluctuation • Power meter failure • Cable disconnection
	Power meter communication error						• Power meter failure • Cable disconnection
	Air flowmeter error						• Air flowmeter failure • Cable disconnection
Blow cleaner	Blow cleaner travel error alarm	Flashing				Blow cleaner operation stopped	Blow cleaner travel error
Bobbin conveyor	Empty conveyor clog detection	Flashing				Bobbin conveyor operation stopped	Empty conveyor clog occurred

Classification	Alarm Type	Signal tower		Rotation signal warning		Machine Status	Cause
		Red	Yellow	Red	Yellow		
Water splicer	Water Tank Level alarm	Flashing				Unit yarn splicing stop	Empty water tank
	Water tank pressure down alarm						Low water tank pressure
	Water pipe residual air alarm						Air bubbles present inside water pipe
AC/DC Converter	Converter error	Flashing				Stopping operation	Converter error
	Converter communication error					Operation continued	Converter communication error
	Converter CPU error					Stopping operation	Converter CPU error
	Converter output short error						Converter output short error
	Converter DB circuit error						Error occurred on regenerative circuit for converter
	Converter FET Damage						FET element damage inside converter
	Converter DB resistor overheat error						Overheating error occurred on regenerative resistor for converter
	Converter DB resistor protection						Protective function on regenerative resistor for converter enabled
	Converter DB resistor break detection						Break detected on regenerative resistor for converter
	Converter Output Voltage Error						Converter output voltage error
Span slave	Span slave output short error	Flashing				Machine operation stopped	Span slave output short error
	Span slave communication error					Operation continued	Span slave communication error
Package conveyor	Package conveyor alarm		Flashing (High speed)			Operation continued	Package left unattended for extended period of time on package conveyor
	Package conveyor inverter alarm	Flashing				Package conveyor operation stop	Package conveyor inverter alarm occurred
	Package conveyor inverter communication error						• Inverter failure • Cable disconnection

Sec 2 Winding Unit

2-1 Layout of electrical equipment

Operation & display parts



Status display
(Alarm code display)
(Used for maintenance functions)

Maintenance LED (Green)
(Used for maintenance functions)

Operator call LED (Red)
(Lights up during alarm)

Operator call LED (Blue)
(Lights up when package is full and flashes for full package warning)

Maintenance button (Left)
(Used for maintenance functions)

Maintenance LED (Red)
(Used for maintenance functions)

Alarm reset button (Up)
(Alarm reset)
(Yarn threading operation)

Alarm LED (Up)
(Lights up and flashes during package alarm)

Alarm rest button (Center)
(Alarm reset)

Alarm LED (Center)
(Lights up and flashes during bobbin alarm)

Maintenance button (Right)
(Used for maintenance functions)

Alarm rest button (Down)
(Alarm reset)
(Forced bobbin ejection)

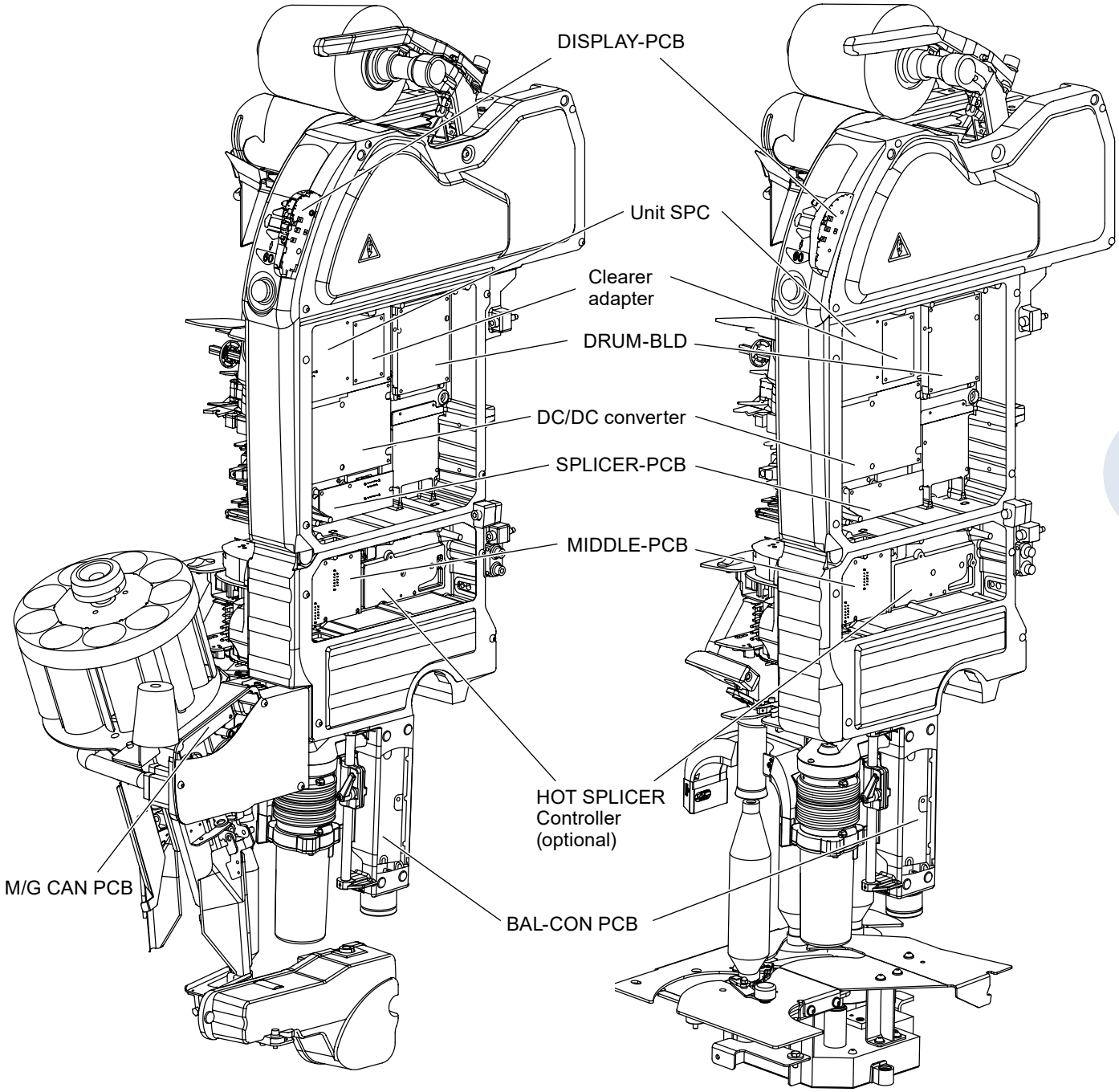
Alarm LED (Down)
(Lights up and flashes during bobbin alarm)

Unit operation switch
(ON during operation)
(OFF during operation stop)

2-2 Board layout

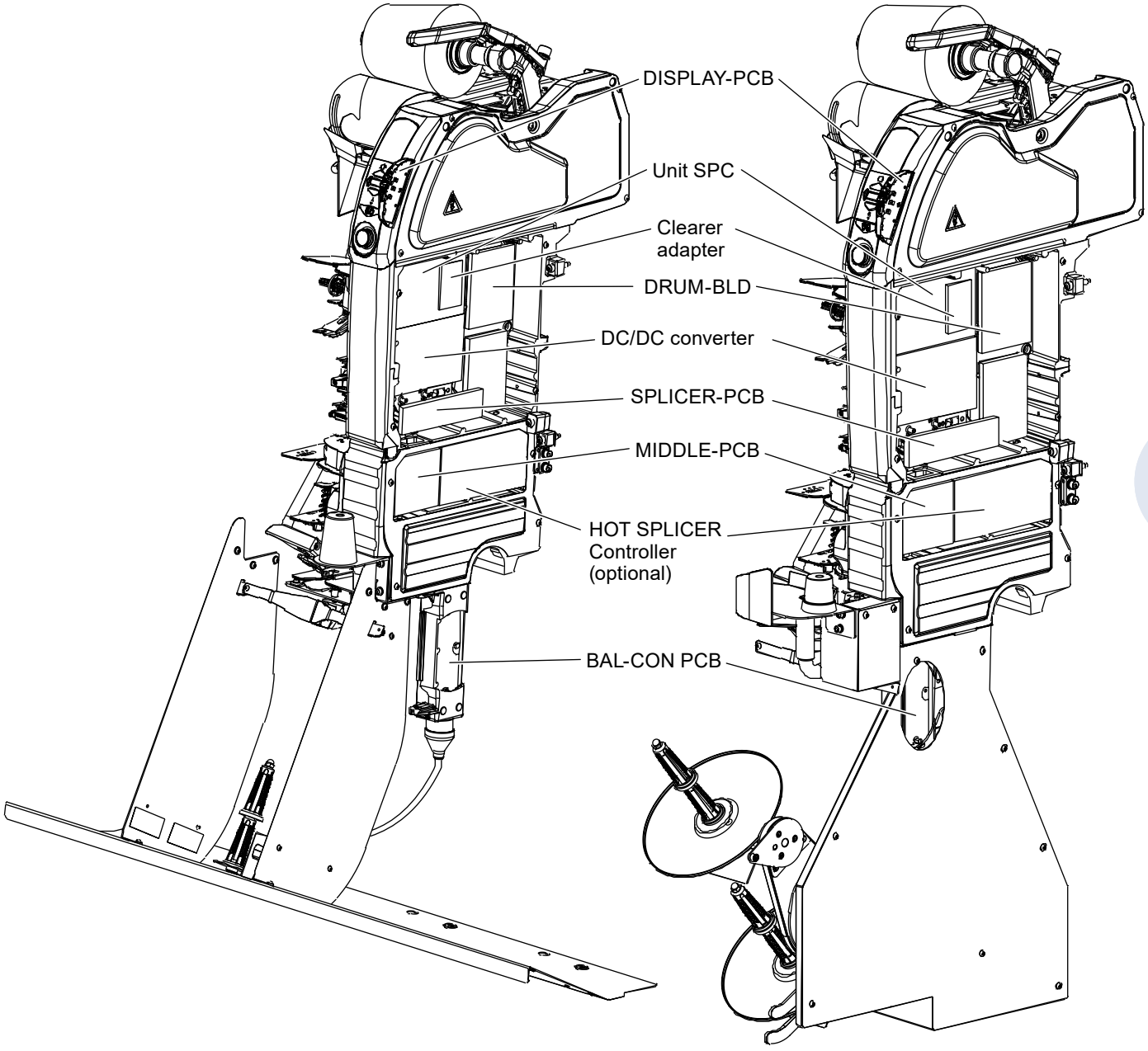
Straight Magazine

Bobbin Tray (Link Coner)

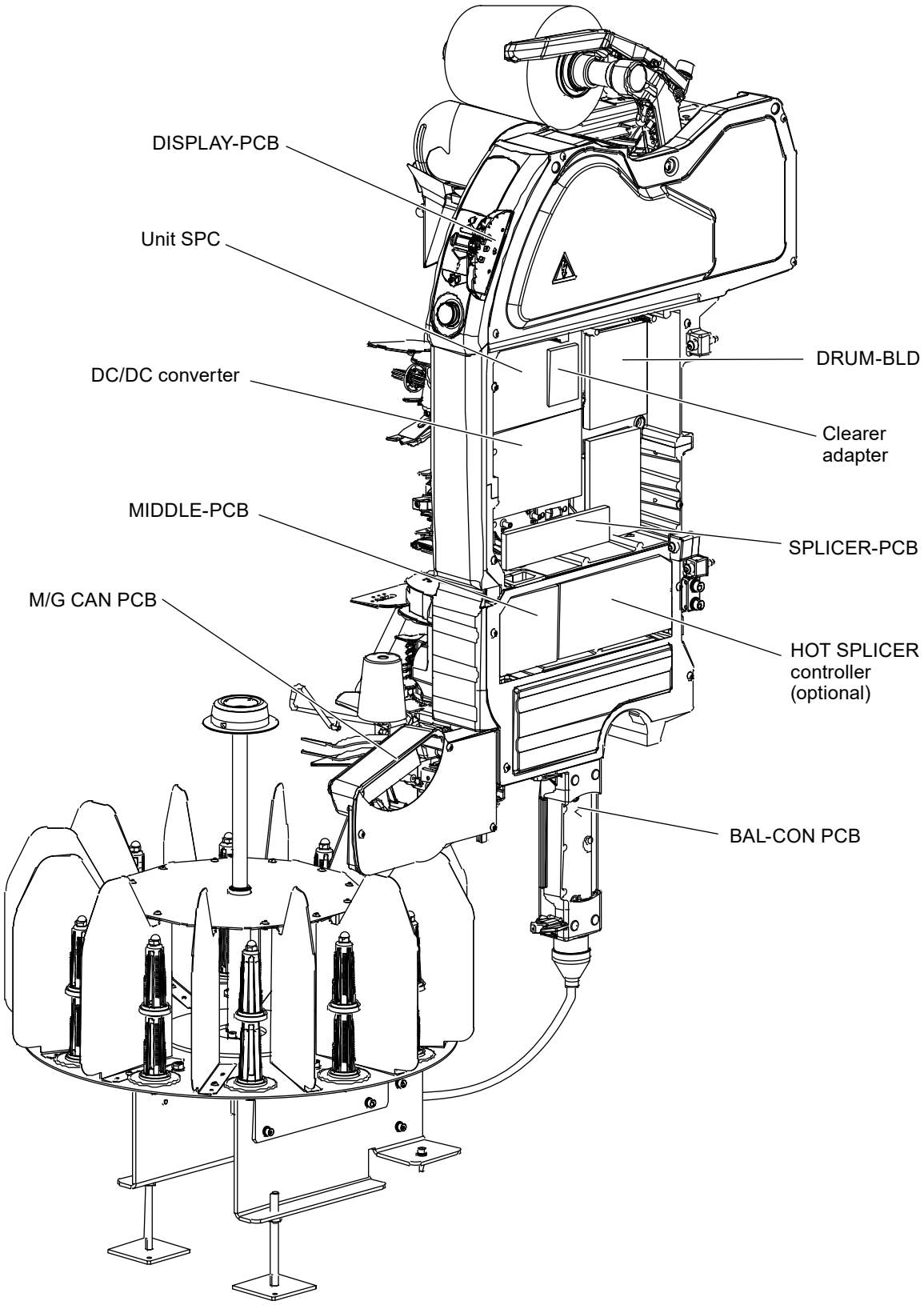


Cone to Cone Model-I

Cone to Cone Model-II



Rewind Magazine



2-3 Status Display

- **Status display**

Spindle No. display	Machine stopped
"– – –" Lit	Omit spindle
"– – –" Flashing	Yarn splicing stop signal received
"– – –" Progress display	Cancelling yarn splicing stop

- **Alarm display**

Displays the alarm code when an alarm occurs.
(Refer to Chapter 6, 1-1 in instruction manual or VOS screen ID <B0000>)

- **Other displays**

Displays data for each check mode when using the unit check mode.
(Refer to the VOS Screen ID <41110> for unit check mode settings)

* Display priority

The priority hierarchy of items shown on the unit status display is given below.

Display priority (high)

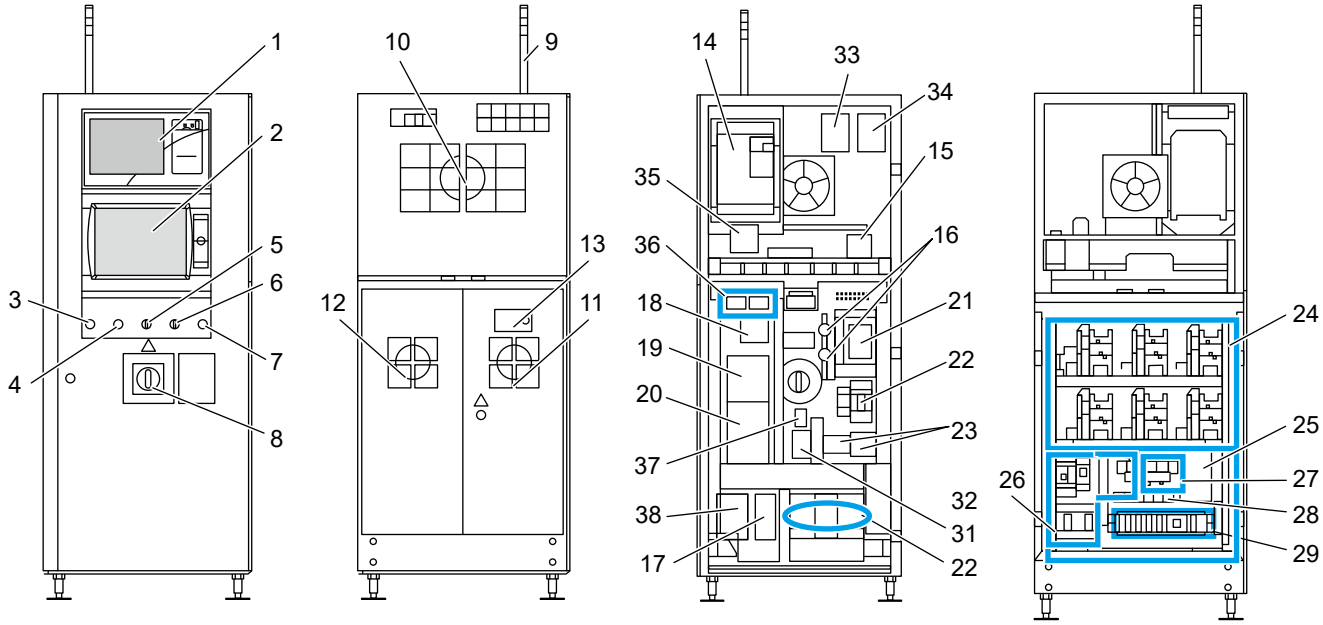
- Omit spindle
- Alarm
- Check mode
- Spindle No. or splicing stop

Display priority (low)

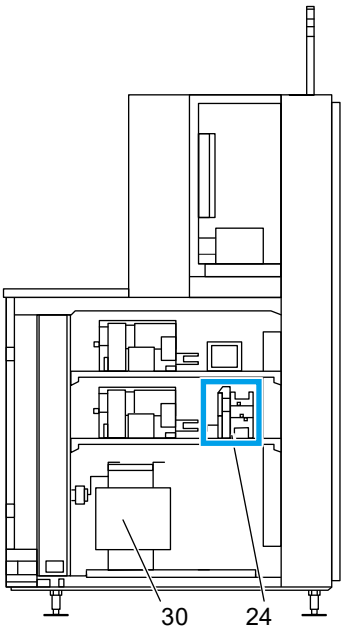
Sec 3 Main Machine

3-1 Layout of Electrical Equipment

Main Control Box

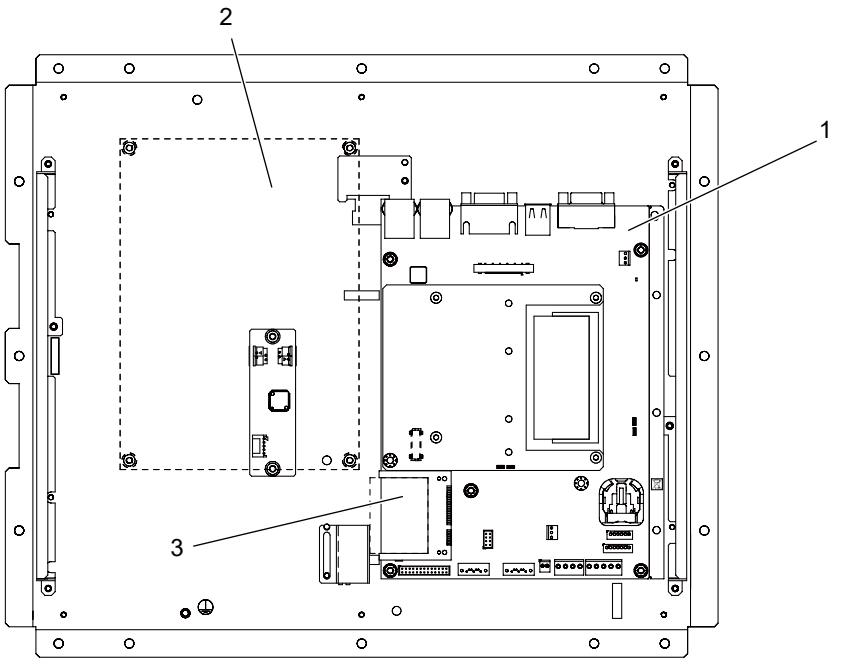


(1) Clearer control box
(2) VOS III
(3) Stop button
(4) Start button
(5) Bobbin/Tray conveyor switch
(6) Blow cleaner switch
(7) Clean mode button
(8) Main switch
(9) Signal tower
(10) Cooling fan (Top)
(11) Cooling fan (Bottom-right)
(12) Cooling fan (Bottom-left)
(13) Package conveyor start button
(14) Blower inverter
(15) DC reactor
(16) Noise filter
(17) DC control power supply
(18) Gateway PCB
(19) PCB for main fiber SPC
(20) Expanded PCB for main fiber SPC
(21) PCB for power distribution
(22) Circuit breaker
(23) Magnet contactor
(24) AC/DC converter
(25) Interface PCB
(26) Circuit breaker
(27) Motor breaker
(28) Magnet contactor
(29) Connectors for machine wiring connections
(30) T1 trance
(31) PCB for power outage detection
(32) Soft starter
(33) Package conveyor inverter
(34) Return conveyor inverter
(35) Power meter
(36) Communication distribution board
(37) Current sensor
(38) DC control power supply (for VOS, MCU)



(80 winding unit machine only)

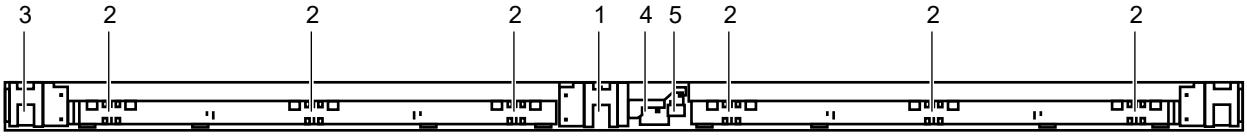
VOS III



[Rear view]

(1) VOS CPU board (2) MCU (Machine Control Unit) board (3) C-FAST

Unit duct



(Length of 1 span)

(1) Span slave print circuit board
(2) PCB for branching communications
(3) Repeter print circuit board
(4) Power supply branch connectors (winding unit)
(5) Power supply branch connectors (dust collector [option])

3-2 Principal functions for main machine

Machine operation & stop controls

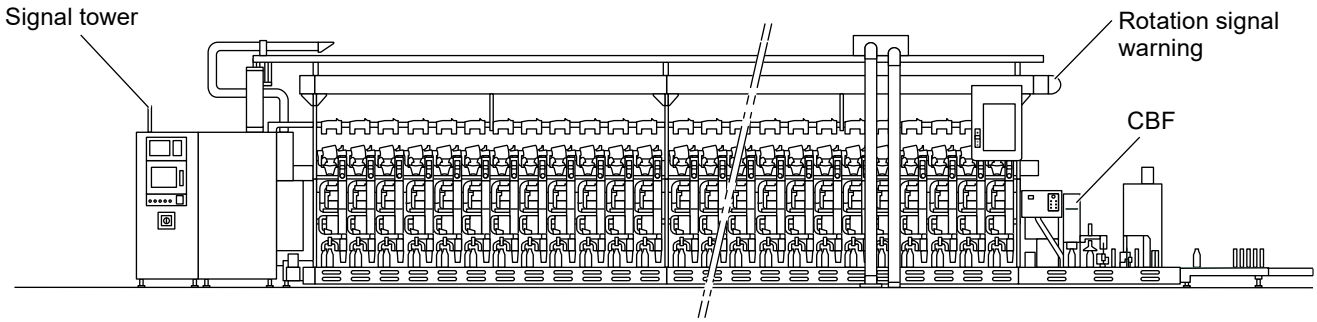
They control the overall start and stop operations for the machine.

Machine Alarm Detection & Support Method Display

The alarm is detected, the machine and devices are stopped, and the alarm location is displayed.
When an alarm occurs, the tower signal and rotation signal warning notify the surrounding personnel, and a picture of the problem location and the support method are displayed.

Machine operation status display

The signal tower on the main control box and the out-end rotation warning signal notify surrounding personnel about the machine operation status.



[The signal tower on top of the main control box]
This tower notifies the surrounding personnel about the general alarms for the machine.

	Lit	Flashing	
		At 0.2 second intervals	At 2 second intervals
Red	AD error	Communication error	Fixer call*
Yellow	---	Operator call*	---
Green	Operating	---	Stop during operation due to clean mode (Cycle stop)

* Refer to Chapter 6, 1-2.

[Out-end Rotation Warning Signal of the Winding Unit (Link Coner, Bobbin Tray)]
This rotation warning signal notifies the surrounding personnel about the alarms related to the CBF.*

	Lit	Flashing	
		At 1 second intervals	At 2 second intervals
Red	• CBF error • Steam setter problem	• Bypass line 1 full • Bypass line 2 full	• Emergency stop • Spinning frame problem
Yellow	• Bypass line 1 operator call • Bypass line 2 operator call • Bypass line 1 full • Bypass line 2 full • Parts feeder bobbin empty • Parts feeder hoist at upper end	---	---

* Refer to the Chapter 7 (VOS) for further details on the alarms.

Blower control

Blower motor is run based on VOS settings.

* For details, refer to Chapter 5Ba.

Tray conveyor & bobbin conveyor control

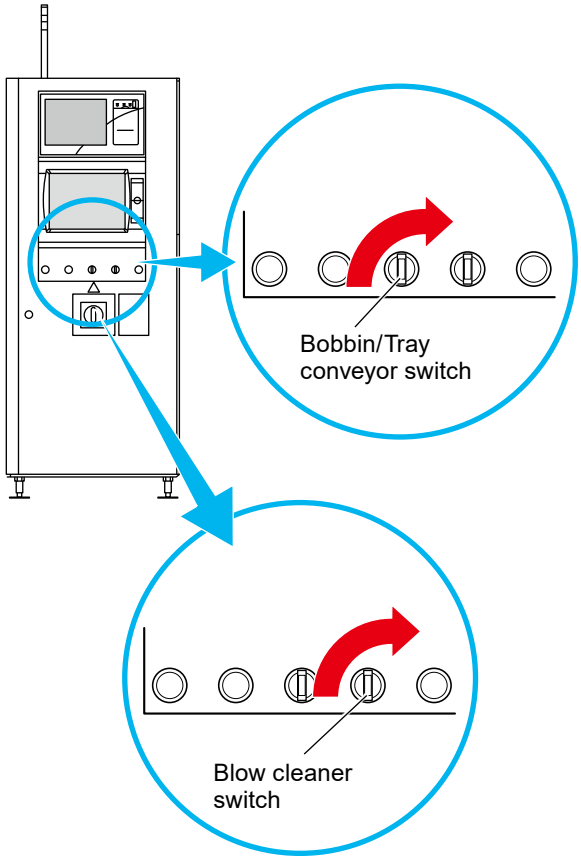
This control drives either the bobbin conveyor (Magazine) or the tray conveyor (Bobbin Tray) using the bobbin / tray conveyor switch on the switch panel located in the main control box.

* There is also a drive switch on the out-end side for the bobbin conveyor.

Blow cleaner control

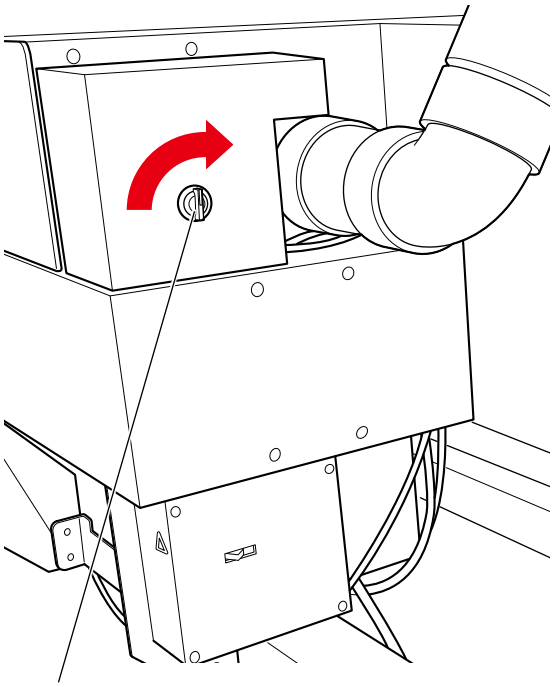
The drive for our in-house made blow cleaner is controlled using the blow cleaner switch on the switch panel located in the main control box.
Intermittent operation is also possible.

* Intermittent operation is standard on equipment with 36 winding units or less, and optional on equipment with 38 winding units or more.



Dust collector control

There is a dust collector system for each span.
It is controlled using the dust collector operation switch for Span No.1.



Package shutter control

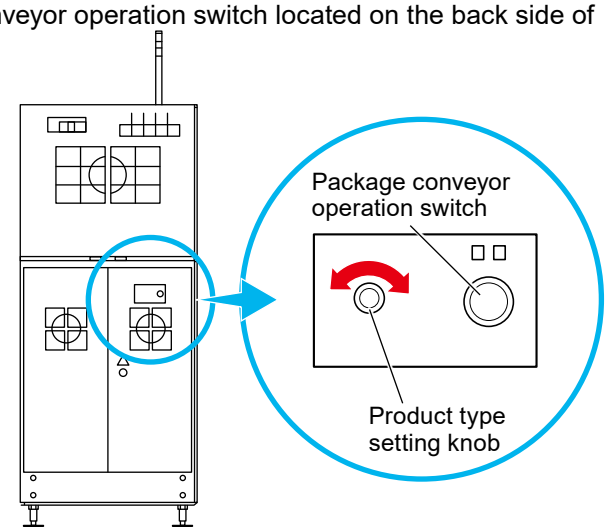
The product type is set using the package conveyor product setting knob. Pressing the start button opens the corresponding shutter for the product type.

* The product type for each span is set on the VOS.

Package conveyor control

The package conveyor is controlled using the package conveyor operation switch located on the back side of the main control box. The LED for the switch lights up during drive cycle operation.

* When equipped with a package shutter, the package conveyor is driven after the package shutter operation.



[Manual Stop]
Pressing the switch again during drive cycle operation stops the operation.

[Auto Stop]
Operation automatically stops when the package detection sensor located on the end of the machine does not detect any package for a certain amount of time.

* The auto stop time varies depending on the machine length.

Tray level control

This function stops and re-starts operation for the winding unit per span, depending on the supply bobbin status of the winding unit. The tray detection sensor attached to each span detects the bobbin supply status.

* This function comes standard with the Bobbin Tray and is optional on Link Coner.

* The criteria for the auto stop and restart operation for the winding unit are set on the VOS.

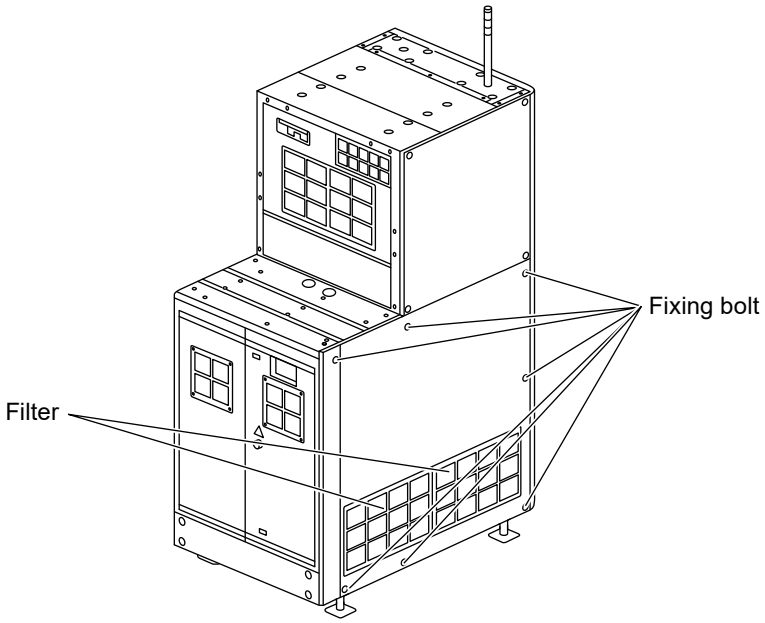
Sec 4 Maintenance

Main control box

- **Inspection & cleaning**

The temperature inside the main control box will increase if yarn waste, cotton fly or other contaminants have built up on the box's filter. This temperature increase can reduce the life of the electrical components or damage them.
In addition, the VOS panel may rise or pop up if the pressure inside the box increases.

Frequency	Item	Guideline
Monthly	Filter	• Remove the side cover of the main control box and clean from the inside part of the cover using an air gun, etc. * Loosen the seven fixing bolts, and remove the side cover. • Check for clogging



Blower inverter

- **Replacement procedure**

Refer to the inverter instruction manual for details.

1. **Remove the detachable terminal with parameter back-up function from the new inverter.**
2. **Turn off the main switch on the main control box.**
   Wait until the inverter CHARGE lamp goes out.
3. **Remove the detachable terminal with parameter back-up function from the damaged inverter.**
   * It is not necessary to remove the cable connected to the detachable terminal with parameter back-up function.
4. **Replace the damaged inverter with the new one and attach in original locations.**
5. **Attach the detachable terminal with parameter back-up function**
6. **Check there are no shorts or earth faults with the circuits connected to the inverter.**
7. **If there are no problems, turn ON the main switch in the machine control box.**
8. **Test run the machine and check there are no problems with functionality.**

Return conveyor inverter, package conveyor inverter

- **Replacement procedure**

Replace after checking “9 Maintenance and inspection precautions” in the inverter instruction manual.

1. **Turn off the main switch on the main control box.**
   * Use a tester to verify that the voltage is 30 V or below after 10 minutes have elapsed after the power is cut off.
2. **Disconnect the wiring from the damaged inverter, and replace with the new inverter.**
3. **Reconnect the wiring to the new inverter.**
4. **Check there are no shorts or earth faults with the circuits connected to the inverter.**
5. **If there are no problems, turn ON the main switch in the machine control box.**
6. **Refer to the electrical drawings and set the parameters.**
7. **Test run the machine and check there are no problems with functionality.**

Sec 5 Consumables

Main Switch UVT (Undervoltage trip device)

The main switch is equipped with a UVT (Undervoltage trip device) as an accessory device.
This device trips the main switch to prevent a malfunction or machine damage while recovering from the power outage, or when the factory experiences a drop or low electrical power voltage.

The UVT has a product lifespan. If the life of the UVT is exceeded, it will stop tripping even when the trip conditions are met.
(No. of trips lifespan for UVT function: 3500 trips)

* When the operator turns OFF the main switch, this operation does not impact the lifespan.

If the main switch does not trip during a power outage, replace the UVT with a new device.

* For further details on the replacement procedure, refer to the “UVT Device Installation Guide” that is provided with the UVT.